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# growing tomatoes at home

**T**omatoes are easy for the homeowner to grow in his backyard and they are popular throughout Illinois. The most prized tomatoes are those a person grows himself and most homeowners have room for a few tomato plants, even on the smallest lot. Individual tomato plants that are staked yield from 5 to 15 pounds per plant and nonstaked tomatoes yield from 10 to 30 pounds per plant. Most families harvest all they will use during a summer from less than a dozen plants.

Tomatoes are always in demand for use in salads, sandwiches, and garnishes, or sliced for fresh table use. You can also stew them or process them into juice, catsup, chili, or relish. They are nutritious and a good source of vitamins A and C.

The tomato is a tender, warm-season plant requiring at least 100 frost-free days from seeding to harvest. All sections of Illinois have a long enough growing season to grow tomatoes from seed, but plants are usually started in greenhouses for home gardeners.

Tomatoes will grow in almost any kind of soil and you can have fresh tomatoes all summer if you learn the plant's basic needs. You can successfully grow tomatoes if you give them a little extra care and use the practices described in this circular.

### **Sunshine and Water**

Remember that tomatoes grow best when they receive full sunshine. Plant them away from trees and buildings to get the highest possible yields. The tomato plant needs a lot of water, so make certain that it is easily available. The area must be well drained because tomatoes do not grow well when water stands on top of the ground for long periods.

### **Hints for Small Areas**

You can grow tomato plants in small areas, but you may need to give them special attention. The plants will need less space in limited areas if you train them vertically on stakes, rather than horizontally on the ground. You can grow plants in raised beds, tubs, or in special areas within or adjacent to the patio. Raised beds have the advantage of providing good soil and drainage conditions. Do not overlook less obvious locations, such as fence corners or containers on the balcony or patio. Containers must have drainage holes in the bottom. Tomatoes can be an integral part of your landscape plantings, and it might be appealing to arrange them randomly, rather than to plant them in a straight row (Figs. 1 and 2).

### **Preparing the Soil**

Tomato plants grow well in soils that vary from a light sand to a heavy clay. Work the soil only when the moisture content will not cause it to stick to tools. Good tilth or physical condition of soil is important, especially for heavier soils where careful management is necessary. You can improve tilth by adding organic matter, lime, and fertilizer.

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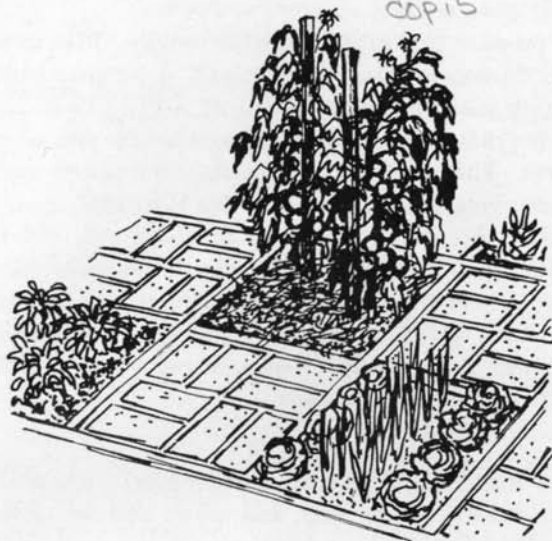


Fig. 1. Tomatoes and certain other vegetables can be grown in small areas in and around the outdoor living area.

You can improve garden soils significantly by adding peat moss, leaf mold, animal manures, or other organic matter when preparing the garden. This is also the best time to add agricultural limestone to the soil, since tomatoes grow best in a nearly neutral (pH 6.5-7.0) soil acidity condition. You will seldom need to add more than 1 pound of liming materials to an area of 10 square feet. Apply these materials in late fall or early spring by mixing them thoroughly to a depth of 8 to 10 inches. Also mix in organic mulches used the previous growing season.



Fig. 2. You can grow some varieties of tomatoes successfully in containers. These add to the decor of the outdoor living area. Patio hybrid is shown here. Some of these may need a stake for support, but don't need to be pruned. (Photo courtesy of the Peto Seed Company.)

## **Fertilizing Tomatoes**

Tomatoes grow and produce best in soils of high fertility. Mix in a complete garden fertilizer during preparation of the soil. A fertilizer with a nitrogen-phosphate-potash analysis of 5-10-5, 5-10-10, 3-12-12, 5-20-20, or 10-10-10 is sufficient for most gardens when applied at the rate of 3 pounds per 100 square feet. These fertilizers will increase the growth and production of many other vegetables you grow in a small garden.

Before the tomato plants become less vigorous in midseason, add 1 pound of fertilizer per 100 square feet. Carefully mix the fertilizer into the surface inch of soil, not closer than 12 inches from the plant. At this time, a high-nitrogen fertilizer, such as a 10-6-4 or 10-10-10 analysis, will stimulate growth. Remember that although tomatoes respond to liberal amounts of fertilizer, too much may hurt the plants.

## **Tomato Varieties**

There are hundreds of tomato varieties developed for special uses and reasons. Tomatoes come in many shapes, sizes, and colors, and the table on page 5 lists a wide selection of "special" varieties.

You may be offered older varieties such as Earliana, Stone, Rutgers, Valiant, Marglobe, Victor, and Pritchard. Many new varieties and hybrids perform better and some have inherent resistance to troublesome diseases. You should be willing to compare new varieties with your "old favorites." Varieties will respond differently to their environment and many of the problems listed on pages 11 and 12 can be reduced by better varieties. Whenever possible grow varieties that are resistant to diseases. Hybrids and standard varieties yield about the same, and use of hybrids is not necessary for successful tomato production. If you grow hybrids you will need to buy new seed each year because plants produced from home-grown seeds will not be true to name and will not perform as well.

## **Selecting Tomato Plants**

It is usually most practical for you, as a home gardener, to rely on commercial sources of plants, rather than to grow plants from seeds. Tomato plants are available at greenhouses, garden centers, grocery stores, or hardware stores. Select plants that are dark green, medium tall, heavy stemmed, and without open flowers or fruit (Fig. 3). Developing fruits on transplants will retard early establishment and growth. The best plants are grown in a 4-inch-diameter soil blocks or pots (Fig. 4).

Plants that are elongated (leggy) or off-colored (light green, yellowish, or reddish) have been crowded or subject to nutritional deficiencies during growth. These plants will start growing slowly after you transplant them to your garden. Harvest will also be delayed. At times you will have no choice and will have to use plants that are tall or "leggy." If so, plant them in a trench long enough to leave only the top 5 or 6 inches of the plant exposed. Roots will develop along the buried portion of the stem.

You must remove all clay and plastic pots and wood bands before

# SUGGESTED TOMATO VARIETIES FOR HOME GARDENS

Variety or hybrid	Fruit color	Fruit size	Suitable for staking	Comments
<b>Medium Early</b>				
Heinz 1350	Red	Medium	No	Resistant to wilt diseases
Campbell 1327	Red	Large	No	Resistant to wilt diseases
Cardinal Hybrid, Moreton Hybrid	Red	Medium	Yes	
Fantastic Hybrid	Red	Medium	Yes	
<b>Main Crop</b>				
Big Boy Hybrid, Wonder Boy Hybrid	Red	Large	Yes	
Manapal, Manalucie	Red	Medium	Yes	Resistant to wilt and foliage diseases
Tom Tom Hybrid, Supersonic Hybrid	Red	Large	Yes	Resistant to wilt diseases
<b>Special</b>				
Jubilee, Sun Ray	Yellow	Medium	Yes	
Ponderosa, Beefsteak	Pink or red	Very large	Yes	Catfacing is common
Pink Lady Hybrid	Pink	Medium	Yes	
Roma VF (paste type)	Red	Small	No	Resistant to wilt diseases
Caro-Red	Orange	Medium	Yes	High vitamin A
Pear	Red or yellow		Yes	Sometimes called salad tomatoes
Cherry (Large)	Red	1¼" dia.	Yes	
Cherry (Small)	Red	½" dia.	Yes	
Tiny Tim	Red	¼" dia.	Containers	Ornamental value, Dwarf
Patio Hybrid	Red	Small	Containers	Resistant to fusarium wilt, Dwarf
Fireball, Galaxy, New Yorker	Red	Small-med.	No	First early

planting tomatoes to permit normal root development. Bury the stem slightly deeper than the original soil level. You should not remove peat containers but you must bury them deep enough so they are completely covered with soil. If the edge of the pot is exposed to the air, moisture loss will occur and root penetration will be restricted when the pot dries out.



Fig. 3. Buy container-grown plants that have plenty of soil around the roots. This is a good example of a plant to buy. (See photo at left.)

Fig. 4. Many kinds of containers can be used with good results to grow tomato plants. Shown are wood flats, wood veneer bands, composition fiber pots, paper bands, clay and plastic pots, and berry boxes. (See photo below.)



## Planting and Spacing

You should set your plants in the ground as soon as possible after buying them, but it may be advantageous to plant them in late afternoon or early evening to help avoid drying and wind damage.

Tomato plants are very susceptible to cold damage and can be killed by frost. Suggested planting dates for Illinois are shown in Fig. 5. If a light frost is predicted, cover plants that night with baskets, hot caps, or paper to protect them. Remove the covering the next day.

Staked, nonstaked, standard, and dwarf plants all need different amounts of space. You can grow any staking variety in an unstaked manner by giving it more room. It is impractical to train a dwarf or nonstaked variety on a stake because pruning will greatly reduce the yield possibilities. Space dwarf plants 12 inches apart. Staked plants that you prune to single stems should have 12 to 18 inches between plants. Plants pruned to two or more stems need a space of 18 to 24 inches between plants. Space rows 3 to 5 feet apart. Leave 2 to 4 feet between plants of non-staked standard varieties and space the rows 4 to 6 feet apart. Containers should be at least 10 to 12 inches in diameter and depth to provide





Fig. 5. Spring planting dates for tomatoes in Illinois.

enough soil and nutrition for proper growth. Larger containers that have more water-holding capacity will need less attention.

Apply a starter fertilizer solution when you set the tomato plants into your garden. Starter solutions are made up of a water-soluble starter fertilizer that is high in phosphorus, such as 10-50-10 or 10-52-17, or from a standard garden fertilizer, such as 10-10-10, 5-10-5, or 20-20-20. To mix your starter solution, add 2 to 3 tablespoons for each gallon of water you use. Apply the solution at the rate of 1 pint per plant at time of setting.

### Training and Pruning

Training and pruning of tomato plants is helpful because you can grow more plants in a limited area, and the tomatoes may be larger, cleaner, and free of ground rots. The fruits are easier to harvest and the plants lend themselves to better insect control. Unfortunately, not all varieties are adapted for staking. You should also realize that the yield of staked plants is reduced, more work is necessary for proper training, and under some conditions there may be greater losses of fruit from cracking, blossom-end rot, and sunburn.

One of the most common pruning systems is the single-stem method in which all shoots or "suckers" are prevented from developing into side branches (Figs. 6, 7, and 8). The double-stem system removes all except the first sucker immediately below the first flower cluster. This first sucker is permitted to develop into a second stem. The two stems are tied to the



Fig. 6. Shoots develop from the stem at the base of the leaf. To grow a single-stem plant the shoots must all be removed as you prune. You can easily snap them off when they are small.



Fig. 7. This plant has been pruned to a single stem and is ready to be tied to the supporting stake.



Fig. 8. This is the proper way to tie the stem to the supporting stake. Twine should be loosely looped around the stem and tightly tied to the stake.



same stake and subsequent suckers are removed from both stems. With two stems there should be more production, and better foliage decreases the possibility of losses from sunburn and cracking (Figs. 9 and 10). With either method, the supporting stake may be wood or steel and should be at least 6 feet high.

The advantages and disadvantages of staked tomatoes are modified by intermediate systems, such as training the plant on a fence and using a platform or wire fence cylinder (Figs. 11, 12, and 13).

### Care During the Season

Weeds are a major nuisance, and hoeing and hand pulling of weeds are standard ways of getting rid of them. During hoeing or cultivation, work the soil just deep enough to kill the weeds, while leaving the roots of the tomatoes undamaged. Many gardeners mulch established plants to deter weeds and reduce moisture evaporation from the soil. Good mulch materials include peatmoss, hay, straw, ground corncobs, grass clip-



Fig. 9. If you want to grow a double-stem plant, let one of the early shoots develop. Remove all other shoots from both stems as they develop.



Fig. 10. A mature, double-stem plant properly trained and tied. The arrows point to each stem.

pings, or a film of black polyethylene sheeting. It is best to apply 2 to 4 inches of organic materials on top of the soil. This amount will smother most weeds and minimize fluctuations in soil temperatures and moisture.

A good water supply is particularly important when you establish the plants in the garden and during fruiting, and especially when the roots are seriously confined by containers. During most seasons not much supplemental water is needed, except during prolonged dry periods. When you water your garden, soak the soil to a depth of 6 inches or more every 10 days to 2 weeks. Plants growing in small containers need daily watering.

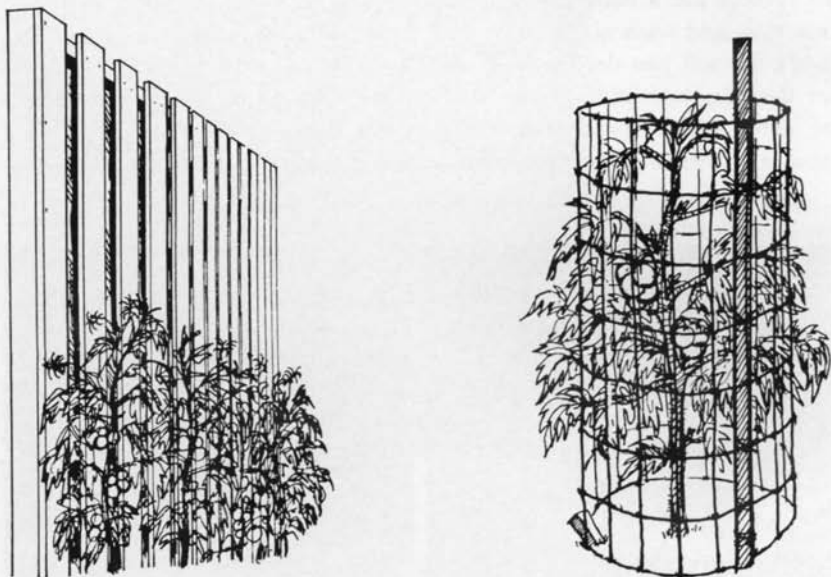
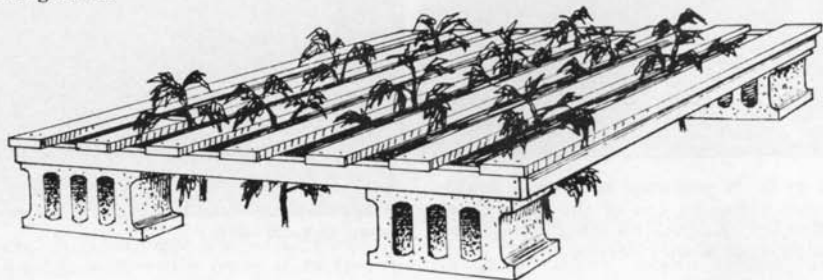


Fig. 11. Both single- and double-stem plants can be supported by various types of fences. Do not plant tomatoes on the north side of some fences, since this would shade the plants.

Fig. 12. Unpruned tomato plants may be supported by wire cylinders. This prevents contact between soil and fruits.

Fig. 13. Many homemade platforms can support tomatoes and keep the fruits off the ground.



## Harvesting and Handling Tomatoes

Most people want red ripe fruit. When average daily temperatures are 75° F. or below, the vine-ripened quality is unparalleled. But when daily temperatures are higher, the ripening process softens the fruit and the full, red color is retarded. Under such circumstances it is best to harvest the fruits in a pink stage of maturity and further ripen them in the home at temperatures of 60° to 70° F. The lower temperatures favor firmer flesh.

Tomato fruit in the mature green or pink stage is sensitive to cold, and temperatures below 60° F. prevent normal development of the ripening process. Low temperatures may also increase decay, instead of preventing it.

You can harvest green mature fruit in the fall and hold it for later consumption. Select fruits that are free of disease, wrap them in paper, and hold them near 60° F. They will ripen slowly and provide the family with a quality product for several weeks. Store fully red ripe tomatoes in the refrigerator.

## Common Problems

A few of the disorders frequently encountered by home gardeners are discussed in this section. There is not much that you can do about these problems, but it is good to be able to recognize them. (See comments on selecting varieties, pages 4 and 5.) With the exception of chemical injuries, fruit with these problems may be eaten. You may want to cut off the affected portions of the fruits.

**Flowers drop off.** Tomatoes do not set fruit, especially on early flower clusters, when flowers drop off. This usually occurs when night temperatures are lower than 55° F. or when day temperatures are above 95° F., especially with hot, drying winds. Varieties will differ in their response to temperatures. Fruit-setting hormones are available, but they are not practical under Illinois conditions. Spraying flowers with hormones causes the tomato fruits to be puffy and hollow. After flowers drop off, the plant usually develops normally as the weather improves.

**Leaf roll.** The older and lower leaves of some varieties may roll tightly, becoming stiff and leathery. This is a physiological condition and is not a disease. Leaf roll will occur with some "first early" varieties and is more common on plants that are trained and pruned. Fruiting is unaffected.

**Chemical injury.** Tomato plants are very sensitive to injury by growth-regulating chemicals and weedkillers. Drift from 2,4-D and similar chemicals commonly used on lawns and in commercial corn fields, causes distorted leaves, twisted stems, dropping of flowers, and fruit abnormalities. This drift may originate as much as one-half mile or more away. Contaminated sprayers are also a source of injury.

**Catfacing.** The blossom end of the tomato is rough with brown scar tissue. The tomatoes may be severely malformed. Some large-fruit varieties tend to have more catfacing than others. Catfacing is often confused with 2,4-D injury.

**Cracking.** Fruit cracking may be severe for some varieties, and the problem is increased by training and pruning. When fruit is enlarging, cracking may be increased if moisture varies too much from day to day.

**Blossom-end rot.** Blossom-end rot occurs wherever tomatoes are grown. It is a dry, leathery, brown rotting of the blossom end of the tomato caused by a combination of calcium deficiency and a great fluctuation in available moisture. Training and pruning increases blossom-end rot. Remove affected fruit so others on the plant will develop normally.

**Poor color development and sunscald.** High temperatures retard the development of a full, red color in tomatoes. Exposed fruits are susceptible to sunscald, which is localized damage of some of the tissues in the fruit. (See discussion of harvesting on page 11.)

**Cloudy spots.** Irregular whitish spots just under the skin of green and ripe fruit can be caused by feeding of insects.

**Walnut toxicity.** Plants growing under black walnut trees may wilt and die. Avoid growing tomatoes within 50 feet of these trees.

**Insects and diseases.** Certain insects and diseases may become troublesome. For identification and control recommendations refer to Circulars 882 and 900 listed below.

### **Additional Gardening Aids**

The following publications are available from your local extension adviser or from the listed source.

University of Illinois, Office of Agricultural Publications, 123 Mumford Hall, Urbana, Illinois 61801:

Illinois Vegetable Garden Guide, Circular 882

Growing Vegetable Transplants, Circular 884

Insect Control for the Homeowner, Circular 900

University of Illinois, Department of Horticulture, 124 Mumford Hall, Urbana, Illinois 61801:

Weed Control in the Vegetable Garden, Vegetable Growing No. 4

Vegetable Seed Companies, Vegetable Growing No. 10

Mulching Vegetables in the Garden, Vegetable Growing No. 17

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